



**Aquatic Vegetation of Lake Iroquois  
Chittenden County, Vermont**

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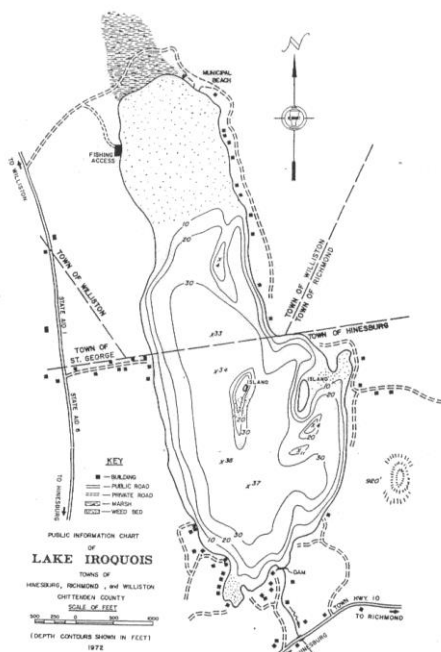
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## Background.

At the request of Chris Conant and Pat Suozzi of the Lake Iroquois Association, Spring and Fall 2023 quantitative aquatic plant surveys were undertaken for Lake Iroquois, Vermont. The surveys occurred two-years post- treatment following aquatic plant management efforts employing the herbicide ProcellaCOR EC in 2021 for Eurasian watermilfoil control. The survey largely duplicated the 2017, 2019, 2021 and 2022 surveys conducted by the author (Eichler 2017, 2019, 2021 and 2022). The surveys consisted of frequency of occurrence and relative abundance data for all aquatic plant species present in points distributed throughout the lake. The Point-Intercept Rake Toss method presently used by the US Army Corps of Engineers and others was employed. The assessment includes the distribution and density of existing aquatic plant communities, the extent of exotic species infestation and a review of ongoing management efforts to control Eurasian watermilfoil (*Myriophyllum spicatum*).

## Methods

### Survey Sites



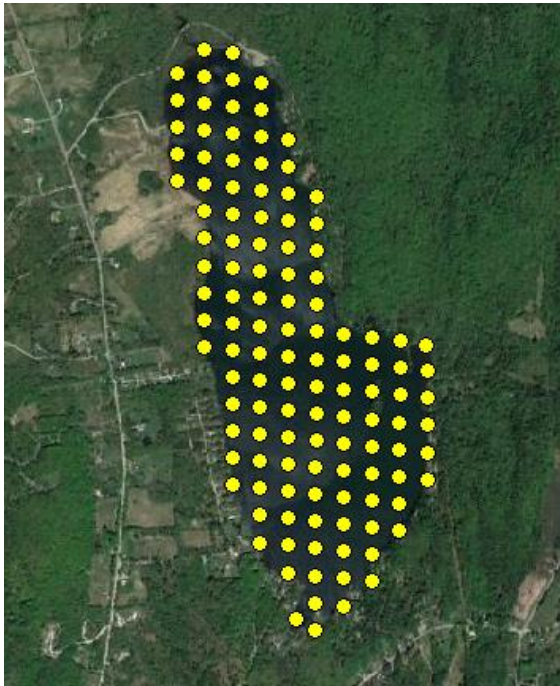
**Lake Iroquois.** Lake Iroquois is located in Chittenden County, in the towns of Hinesburg, Richmond and Williston. The lake has a surface area of approximately 244 acres with a watershed area of 2198 acres. Lake Iroquois has a single outlet with a control structure to maintain lake level. Maximum water depth is reported to be 37 ft with average water depth of 19 feet (VTDEC 2016a). Secchi disk transparency in 2015 averaged 12 ft (3.8 m; VT DEC 2015). Lake Iroquois is classified as eutrophic based on phosphorous and chlorophyll concentrations, indicating that nutrient levels are sufficient to support dense growth of planktonic algae and aquatic plants. Two invasive aquatic plant species are reported for Lake Iroquois, Eurasian watermilfoil (*Myriophyllum spicatum*) and Curly-leaf Pondweed (*Potamogeton crispus*) (VT DEC 2016b). VT DEC records indicate that Eurasian watermilfoil was first confirmed in 1991 while curly-leaf pondweed was present in 1984. An aquatic plant survey of Lake Iroquois in September of 2014 reported over 70 acres

of dense Eurasian watermilfoil growth (Knoecklein 2015). A total of 45 aquatic plant species have been reported for Lake Iroquois in multiple surveys since 1984, however a 2014 survey only reported 23 species. Loss of native species is a commonly reported phenomenon in lakes with severe infestation by Eurasian watermilfoil and/or other invasive aquatic plant species (Madsen et al. 1991). In a survey conducted by the author in 2017, a total of 25 species of aquatic plants were observed in Lake Iroquois (Eichler 2017). The aquatic plant community included sixteen submersed species, two floating-leaved species, and seven emergent species.

Duck celery (*Vallisneria americana*) and coontail (*Ceratophyllum demersum*) were the most common native plants. Eurasian watermilfoil (*Myriophyllum spicatum*) was present in 24% of survey points. Small declines in the frequency of occurrence of the majority of native species were observed in 2019 (19 of 23 species when compared to the 2017 survey), possibly as a result of the expansion of Eurasian watermilfoil to 43% of survey points. In the Spring of 2021 prior to herbicide treatment, Eurasian watermilfoil was present in 24% of survey points. In September post-treatment and again in June of 2022, Eurasian watermilfoil was absent from all survey points. In September of 2022, Eurasian watermilfoil was found at a single survey point at the south end of the lake.

Hand harvesting efforts began on Lake Iroquois in 2008 to control dense growth of Eurasian watermilfoil. The aquatic weevil (*Euhrychiopsis lecontei*) population was supplemented in 2008 and 2009 to provide a biocontrol agent for Eurasian watermilfoil. Extensive growth of Eurasian watermilfoil reported in 2014 suggested a more intensive management effort was necessary. In 2016, diver assisted suction harvesting (DASH) for Eurasian watermilfoil control was employed in the boat launch area and near the LIRD beach. Over a period of 2 weeks, divers harvested over 5000 gallons of Eurasian watermilfoil. Benthic barriers (mats) were installed in 2017 to maintain the areas harvested by DASH in 2016. In 2019, DASH collected approximately 2000 gallons of Eurasian watermilfoil, representing a fraction of Eurasian watermilfoil growth. Residents remained concerned that Eurasian watermilfoil growth was exceeding the capacity of the existing management effort. The management effort was expanded in 2021 to include an herbicide, with 40 acres at the north end of Lake Iroquois treated with ProcettaCOR EC. No organized management efforts occurred in 2022.

**Figure 1. Map of Lake Iroquois with potential point intercept survey locations .**



**Species List and Herbarium Specimens.** As the lake was surveyed, the occurrence of each aquatic plant species observed in the lake was recorded and herbarium specimens collected where necessary. Herbarium specimens were pressed, dried, and mounted (Hellquist 1993); and became part of the permanent collection at the Darrin Fresh Water Institute in Bolton Landing, NY. All taxonomy is based on Crow & Hellquist, 2000.

**Point Intercept Surveys.** The frequency and richness of aquatic plant species were evaluated using a point intercept method (Madsen 1999). At each grid point intersection, all species located at that point were recorded, as well as water depth. Species were located by a visual inspection of the point and by deploying a rake to the bottom, and examining the plants retrieved. A total of 73 points were surveyed in the Spring, and 79 points were

surveyed in the Fall for Lake Iroquois, based on a 100 m grid. Point intercept plant frequencies were surveyed on June 9, 2023 and September 14, 2023 to provide pre- and post-management data. A global positioning system (GPS) was used to navigate to each point for the survey observation.

***Relative abundance in the Point Intercept surveys.*** To characterize relative abundance of each of the species identified in the point intercept survey, a scale developed by Cornell University and the US Army Corps of Engineers was employed. For each rake toss, the relative abundance of each plant species collected was recorded based on this rating scale. Maps of the distribution of each species by its relative abundance is included in Appendix A.

**Relative abundance scale based on US Army Corp/Cornell methods.**

<b>Code</b>	<b>Rating</b>	<b>Abundance</b>
0	no plants	
1	trace growth of plants	fingerful on rake
2	sparse growth of plants	handful on rake
3	medium growth of plants	rakeful of plants
4	dense growth of plants	difficult to bring into boat

## Results and Discussion

In September of 2023, the aquatic plant community of Lake Iroquois included twenty-three submersed species, three floating-leaved species, one floating species and six emergent species (Table 1), including some species observed but not collected in the point intercept survey.

**Table 1. Species list for Lake Iroquois. Species in red are invasive.**

Species Name	Common Name	Habit
<i>Brasenia schreberi</i>	water shield	fl
<i>Ceratophyllum demersum</i> L.	Coontail	s
<i>Chara</i> sp.	muskgrass, chara	s
<i>Eleocharis acicularis</i> (L.) Roemer & Schultes	needle spike-rush	e
<i>Elodea canadensis</i> Michx.	Elodea	s
<i>Isoetes echinospora</i> Dur.	Quillwort	e
<i>Lemna minor</i> L.	Duckweed	f
<i>Lemna trisulca</i> L.	Duckweed	s
<i>Megalodonta (Bidens) beckii</i> Torr.	water marigold	s
<i>Myriophyllum spicatum</i> L.	Eurasian watermilfoil	s
<i>Najas flexilis</i> (Willd.) Rostk. & Schmidt.	bushy pondweed	s
<i>Najas guadalupensis</i> L.	southern naiad	s
<i>Nuphar variegata</i>	yellow pondlily	fl
<i>Nymphaea odorata</i> Ait.	white waterlily	fl
<i>Polygonum amphibium</i>	Smartweed	e
<i>Pontederia cordata</i> L.	pickerelweed	e
<i>Potamogeton amplifolius</i> Tuckerm.	largeleaf pondweed	s
<i>Potamogeton crispus</i> L.	curlyleaf pondweed	s
<i>Potamogeton foliosus</i> Raf.	Pondweed	s
<i>Potamogeton natans</i> L.	floating-leaf pondweed	s
<i>Potamogeton perfoliatus</i> L.	clasping-leaf pondweed	s
<i>Potamogeton praelongus</i> Wulfen	white-stem pondweed	s
<i>Potamogeton pusillus</i> L.	small pondweed	s
<i>Potamogeton richardsonii</i> Oakes	Richardsons' pondweed	s
<i>Potamogeton spirillus</i> Tuckerm.	Pondweed	s
<i>Potamogeton zosteriformis</i> Fern.	flat-stem pondweed	s
<i>Ranunculus longirostris</i> Godron	white watercrowfoot	s
<i>Sparganium</i> sp.	Burred	e
<i>Typha</i> sp.	cattail	e
<i>Utricularia gibba</i> L.	humped bladderwort	s
<i>Utricularia vulgaris</i> L.	great bladderwort	s
<i>Vallisneria americana</i> L.	wild celery	s
<i>Zosterella dubia</i> (Jacq.) Small	water stargrass	s

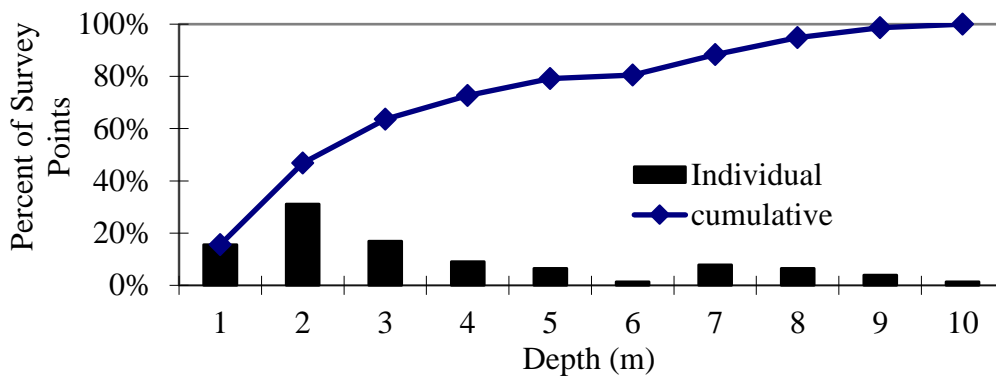
f=floating      fl=floating leaved      e=emergent      s=submersed

Twenty-three species were present in the point intercept portion of the 2023 survey, comparable to the 24, 26, 25, 19 and 23 species reported in 2022, 2021, 2019, 2017 and 2014, even though a greater number of survey points were included in 2014. Combining the results of all surveys, a total of 45 aquatic plant species have been reported for Lake Iroquois, however many of these are classified as wetland species not typically captured by the current survey technique. This number of species greatly exceeds the 15 species typically reported for moderately productive lakes in our region and indicates good water quality and a variety of habitat types. Eurasian watermilfoil (*Myriophyllum spicatum*) and curly-leaf pondweed (*Potamogeton crispus*) were the only exotic species reported in Lake Iroquois. Species richness was quite high, with a number of species occurring in more than 5% of survey points (Table 2).

### Maximum Depth of Colonization

Maximum depth of rooted aquatic plant growth, termed the littoral zone, extended approximately 5.0 meters (16 feet). The majority of survey points were in the littoral zone (Figure 2), providing a reasonable representation of the plant population of Lake Iroquois.

**Figure 2. Depth Distribution of Lake Iroquois Sampling Points in 1 meter depth classes.**



### Species Lists

Maps of the distribution of aquatic plant species for Lake Iroquois are included in Appendix A. Frequency of occurrence results are presented in Table 2. For the June, two year post-treatment survey, musk grass (*Chara/Nitella*) was the most common plant (37% of survey points). Eurasian watermilfoil (*Myriophyllum spicatum*) was present in 3% of the survey points (Figure 1). Curly-leaf Pondweed, another invasive species, was present in 19% of survey points (Figure 2). Common native species in the June 2023 survey for Lake Iroquois included *Elodea canadensis* (27% of survey points), *Vallisneria americana* (19%), *Potamogeton foliosus* (12%), *Potamogeton praelongus* (12%), *Potamogeton zosteriformis* (12%), *Zosterella dubia* (10%), *Potamogeton amplifolius* (10%), *Nymphaea odorata* (10%), *Eleocharis acicularis* (7%), *Ceratophyllum demersum* (7%), *Sparganium sp.* (7%) and *Lemna trisulca* (6%). While the Spring survey provides a confirmation of the distribution of Eurasian watermilfoil, a perennial species, the timing of the survey precludes determination of the distribution and relative abundance of most native species that have not started growing this early in the season. The remainder of this report will focus on comparison of the Fall survey results.



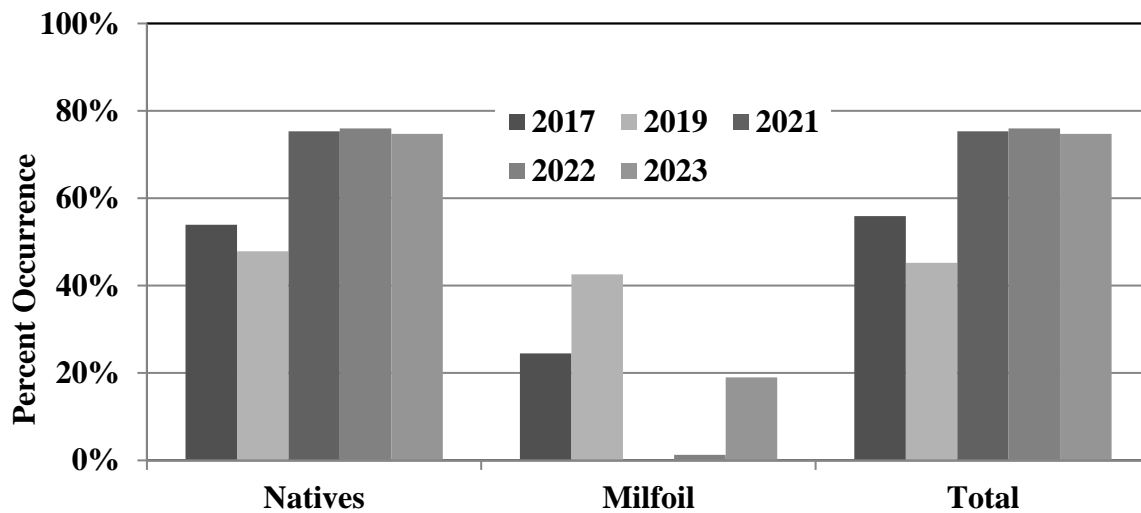
**Table 2. Lake Iroquois percent frequency of occurrence data for Fall surveys only.**

Species Name	Common Name	Fall 2017	Fall 2019	Fall 2021	Fall 2022	Fall 2023
<i>Ceratophyllum demersum</i>	coontail	27.5%	7.8%	6.5%	10.1%	11.4%
<i>Chara</i> sp.	muskgrass, chara	19.6%	10.4%	33.8%	44.3%	46.8%
<i>Eleocharis acicularis</i>	needle spike-rush	4.9%	1.7%	2.6%	1.3%	3.8%
<i>Elodea canadensis</i>	elodea	22.5%	30.4%	44.2%	44.3%	43.0%
<i>Isoetes echinospora</i>	quillwort	1.0%	1.7%			
<i>Lemna minor</i>	duckweed		0.9%			
<i>Lemna trisulca</i>	duckweed	2.9%	0.9%	5.2%	6.3%	1.3%
<i>Myriophyllum spicatum</i>	Eurasian watermilfoil	23.5%	42.6%		1.3%	19.0%
<i>Najas flexilis</i> (Willd.)	bushy pondweed	14.7%	4.3%	5.2%	8.9%	13.9%
<i>Najas guadalupensis</i>	southern naiad	1.0%				
<i>Nymphaea odorata</i>	white waterlily	11.8%	12.2%	15.6%	17.7%	15.2%
<i>Polygonum amphibium</i>	smartweed	1.0%	0.9%	1.3%		1.3%
<i>Potamogeton amplifolius</i>	largeleaf pondweed	5.9%	6.1%	22.1%	17.7%	7.6%
<i>Potamogeton crispus</i>	curlyleaf pondweed	2.0%	1.7%	9.1%		
<i>Potamogeton foliosus</i>	pondweed	6.9%		13.0%	6.9%	
<i>Potamogeton gramineus</i>	variable-leaf pondweed					1.3%
<i>Potamogeton natans</i>	floating-leaf pondweed			1.3%	2.5%	
<i>Potamogeton perfoliatus</i>	clasping-leaf pondweed	2.9%	1.7%	6.5%	2.5%	2.5%
<i>Potamogeton praelongus</i>	white-stem pondweed	9.8%	6.1%	9.1%	8.9%	13.9%
<i>Potamogeton pusillus</i>	small pondweed	6.9%	4.3%	6.5%	10.1%	13.9%
<i>Potamogeton richardsonii</i>	Richardsons' pondweed	4.9%	2.6%	3.9%		5.1%
<i>Potamogeton spirillus</i>	pondweed	1.0%				
<i>Potamogeton zosteriformis</i>	flat-stem pondweed	6.9%	6.1%	13.0%	21.5%	36.7%
<i>Ranunculus longirostris</i>	white watercrowfoot	5.9%	4.3%	2.6%	6.3%	3.8%
<i>Scirpus</i> sp.	bulrush		0.9%			
<i>Sparganium</i> sp.	burreed	1.0%	0.9%	2.6%	2.5%	1.3%
<i>Typha</i> sp.	cattail	1.0%	1.7%	1.3%	1.3%	1.3%
<i>Utricularia gibba</i>	humped bladderwort	2.0%		1.3%	1.3%	3.8%
<i>Utricularia vulgaris</i>	great bladderwort	3.9%	0.9%	6.5%	7.6%	11.4%
<i>Vallisneria americana</i>	wild celery	28.4%	19.1%	40.3%	41.8%	39.2%
<i>Zosterella dubia</i>	water stargrass	20.6%	23.5%	18.2%	24.1%	27.8%

For the September post-treatment sample, muskgrass (*Chara* sp.) was the most common species, present in 47% of survey points. Eurasian watermilfoil (*Myriophyllum spicatum*) was present at numerous locations (19% of survey sites). Common native species included *Elodea canadensis* (43% of survey points), *Vallisneria americana* (39%), *Potamogeton zosteriformis* (37%), *Zosterella dubia* (28%), *Nymphaea odorata* (15%), *Potamogeton pusillus* (14%), *Potamogeton praelongus* (14%), *Najas flexilis* (14%), *Ceratophyllum demersum* (11%), *Utricularia vulgaris* (11%), *Potamogeton amplifolius* (8%), and *Potamogeton richardsonii* (5%).

Native species results were generally comparable to those reported in prior surveys with a few exceptions. A common native species, *Ceratophyllum demersum*, was dominant in Lake Iroquois in 2017 but was observed at lower frequency of occurrence in 2019 through 2023. Pondweed species (*Potamogeton amplifolius*, *P. foliosus* and *P. zosteriformis*) were generally more abundant in September post-treatment surveys, particularly Broad-leaf Pondweed (*Potamogeton amplifolius*). Slight declines in the frequency of occurrence of the majority of native species were observed (19 of 23 species) between 2017 and 2019. The majority of these species increased in frequency of occurrence in 2021 through 2023 surveys. Declines in most native species are observed as a result of invasion and canopy formation by Eurasian watermilfoil, with recovery generally fairly rapid after removal of the canopy.

Seventy-five percent of whole lake sampling points were vegetated by at least one native plant species (Figure 3), 98% of survey points with depths less than 5 m (Figure 4) and 98% of survey points with depths less than 2 meters depth yielded native aquatic plants in Fall of 2023. These results are comparable to 2022, when 76% of whole lake sampling points were vegetated



**Figure 3. Lake Iroquois frequency of occurrence summaries.**

by at least one native plant species, 97% of survey points with depths less than 5 m and 100% of survey points with depths less than 2 meters depth yielded native aquatic plants. In 2021, seventy-five percent of whole lake sampling points were vegetated by at least one native plant species, 94% of survey points with depths less than 5 m and 100% of survey points with depths less than 2 meters depth were vegetated by at least one native plant species. In 2019, forty-five percent of whole lake sampling points were vegetated by at least one native plant species, 91% of survey points with depths less than 5 m and 97% of survey points with whole lake sampling points were vegetated by at least one native plant species. Eurasian watermilfoil was present in 19% of survey points in the Fall of 2023 and 1% of survey points in the Fall of 2022. Absent in 2021, Eurasian watermilfoil was present in 43% of whole lake survey points, and 86% of survey points less than 5 m water depth in 2019, representing the littoral zone or zone of aquatic plant growth. For survey points within the littoral zone, water depth less than 5 m, results similar to

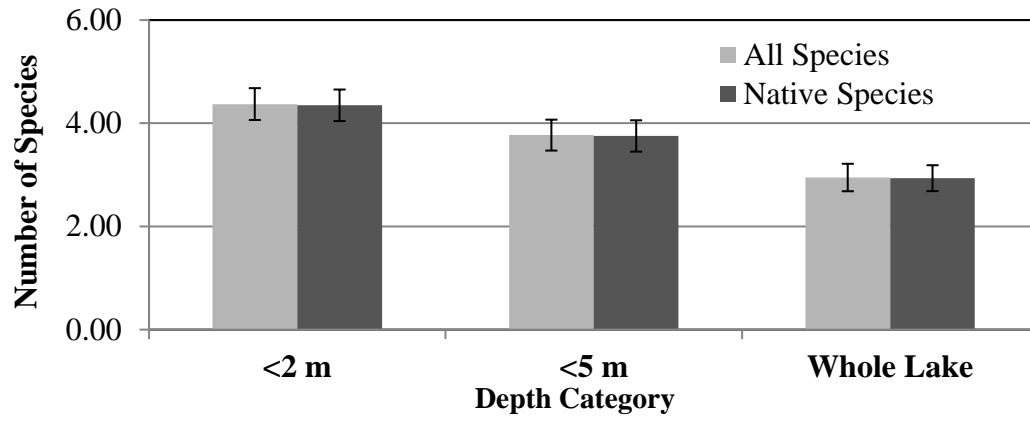
whole lake surveys are reported. The expected relationship of greater frequency of occurrence of aquatic plants with shallower water depth is consistent with that reported by other regional studies. Littoral zone frequency of occurrence values for both survey years were dominated by native species and similar to nearby lakes (Getsinger et al. 2002).

Species richness results are presented in Table 3 and Figure 4. Whole lake native species richness in 2023 was 3.06 species per sample point exceeding the 2.94, 2.65, 1.50 and 2.13

**Table 3. Lake Iroquois species richness comparison.**

Plant Grouping	Water Depth Class	Summary Statistic	Survey Result				
			2017	2019	2021	2022	2023
Native plant species	Whole Lake (all depths)	Mean	2.13	1.50	2.65	2.94	3.06
		N	102	115	77	79	79
		Std. Error	0.25	0.12	0.26	0.25	0.27
	Points with depths <5m	Mean	3.62	3.02	3.33	3.75	4.03
		N	60	57	61	63	60
		Std. Error	0.30	0.27	0.26	0.22	0.24
	Points with depths <2m	Mean	4.50	3.86	4.11	4.35	4.23
		N	50	35	36	43	40
		Std. Error	0.31	0.31	0.32	0.22	0.31
All plant species	Whole Lake (all depths)	Mean	2.40	1.94	2.74	2.95	3.25
		N	102	115	77	79	79
		Std. Error	0.27	0.15	0.26	0.25	0.29
	Points with depths <4m	Mean	4.08	3.91	3.44	3.77	4.28
		N	60	57	61	63	60
		Std. Error	0.30	0.28	0.27	0.22	0.26
	Points with depths <2m	Mean	4.90	4.74	4.25	4.37	4.50
		N	50	35	36	43	40
		Std. Error	0.31	0.32	0.33	0.23	0.34

species per sample point reported in 2022, 2021, 2019 and 2017, respectively. Species richness in this range is comparable to other nearby lakes (Eichler 2016). For survey points exclusively within the littoral zone (depths less than 5 meters), native species richness was 4.03, 3.75, 3.33, 3.02 and 3.62 species per survey point (Figure 4) for 2023, 2022, 2021, 2019 and 2017, respectively. As expected, species richness in the littoral zone and its shallow fringe was higher than whole lake species richness and native species richness increased with the removal of Eurasian watermilfoil.



**Figure 4. Lake Iroquois species richness.  
Error bars are standard error of the mean.**

## Summary

Spring and Fall quantitative aquatic plant surveys were undertaken for Lake Iroquois, Vermont in June and September 2023. The surveys occurred two-years post-treatment following aquatic plant management efforts employing the herbicide ProcellaCOR EC in 2021 for Eurasian watermilfoil control. The September component of the survey duplicated prior surveys conducted by the author (Eichler 2022). The surveys consisted of frequency of occurrence and relative abundance data for all aquatic plant species present in points distributed throughout the lake. The Point-Intercept Rake Toss method presently used by the US Army Corps of Engineers and others was employed. The assessment generated the information necessary to: 1) evaluate the effectiveness of the aquatic plant management efforts, 2) determine the impact of the management efforts on non-target aquatic plant species, and 3) provide data for comparison of post-treatment conditions to prior survey information.

Eurasian watermilfoil (*Myriophyllum spicatum*) populations were first reported in 1990 in Lake Iroquois and confirmed in 1991. Hand harvesting by skin and SCUBA divers has been the basis of the program since the formation of the lake association in 2007. The aquatic weevil (*Euhrychiopsis lecontei*) population of the lake was supplemented in 2008 and 2009 to provide a biocontrol agent for Eurasian watermilfoil. However, by 2014 approximately 70 acres of Lake Iroquois was reported to support dense growth of Eurasian watermilfoil. Benthic barrier and diver assisted suction harvesting (DASH) were included in 2016 through 2019. A more intensive management effort based on herbicide treatment occurred in the Spring of 2021. No organized management efforts occurred in 2022. Limited diver assisted suction harvesting (DASH) was employed in 2023, however a report of dense growth of Eurasian watermilfoil to the west of the water ski course suggested the need for a more intensive management strategy.

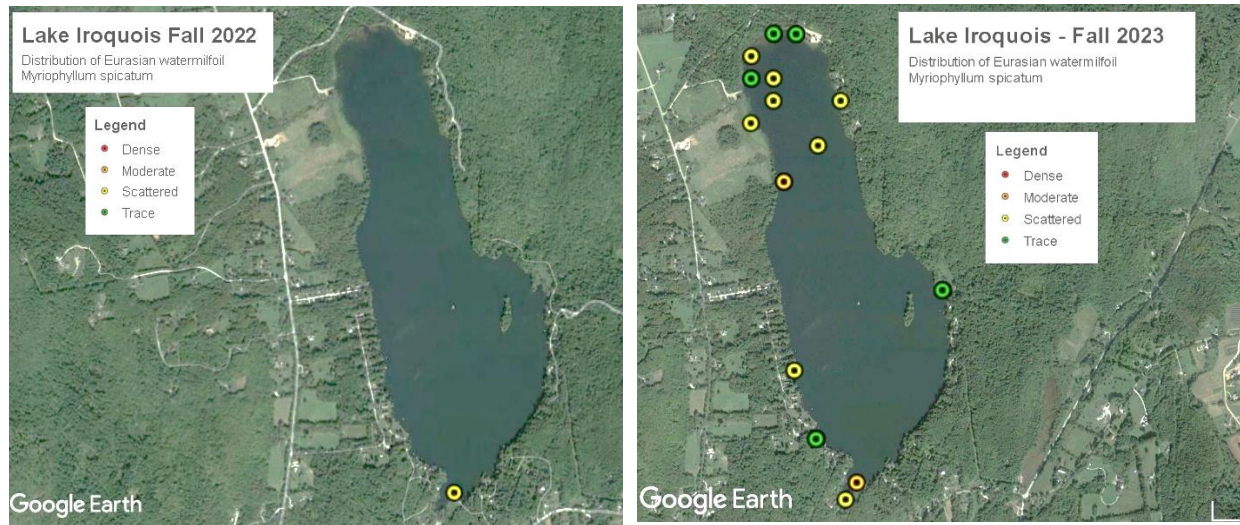
The aquatic plant community of Lake Iroquois in 2023 included twenty-three submersed species, three floating-leaved species, one floating species and six emergent species. Twenty-three species were collected in the point intercept portion of the survey, comparable to the 24, 26, 25, 19, and 23 species reported in 2022, 2021, 2019, 2017 and 2014, respectively. This number of species greatly exceeds the 15 species typically reported for moderately productive lakes in our region and indicates good water quality and a variety of habitat types. One of the species present in Lake Iroquois, Humped Bladderwort (*Utricularia gibba*) is found on Vermont's rare plant list (VT DEC 2012). Eurasian watermilfoil expanded to 3% of survey points in the Spring of 2023 and 19% of survey points in the Fall 2023 survey. Present in 1% of survey points in the Fall 2022 survey, Eurasian watermilfoil was absent in the Spring of 2022 and Fall, post-treatment survey of 2021. Eurasian watermilfoil was present in 24% of survey points in the Spring of 2021, 43% of survey points in the Fall of 2019 and 24% of survey points in the Fall of 2017, representing a decline from the dense growth reported for over 67% of the littoral zone in 2014. The density of Eurasian watermilfoil growth also varied, with most points described as dense growth in 2014 reduced to scattered or moderate growth in 2017 and 2019. Absent in the Fall 2021 and Spring 2022 surveys, Eurasian watermilfoil was reported as scattered growth at a single location in the Fall of 2022. By the Fall 2023 survey scattered growth of Eurasian watermilfoil was reported in several locations and dense growth was reported in the north end of the lake west of the water ski course.

Species richness in Lake Iroquois was quite high, with a number of species occurring in more than 5% of survey points. Seventy-five percent of sampling points were vegetated by at least one native plant species in the Fall 2023 survey. The large number of points supporting native plant species suggests that Lake Iroquois is a prime candidate for recovery of its native plant population following management of Eurasian watermilfoil. Native species richness in the littoral zone was 4.03, 3.75, 3.33, 3.02 and 3.62 species per sample in 2023, 2022, 2021, 2019 and 2017, respectively; and at the high end of species richness values for other regional lakes, which ranged from 1.79 to 4.00 species per sample.

Common native species for Lake Iroquois in the Fall 2023 survey included muskgrass (*Chara/Nitella*, 47% of survey points), waterweed (*Elodea canadensis*, 43%), wild celery (*Vallisneria americana*, 39%), flat-stem pondweed (*Potamogeton zosteriformis*, 37%), water stargrass (*Zosterella dubia*, 28%), white waterlily (*Nymphaea odorata*, 15%), white-stem pondweed (*Potamogeton praelongus*, 14%), bushy pondweed (*Najas flexilis*, 14%), small pondweed (*Potamogeton pusillus*, 14%), coontail (*Ceratophyllum demersum*, 11%), giant bladderwort (*Utricularia vulgaris*, 11%), broad-leaf pondweed (*Potamogeton amplifolius*, 8%), and Richardson's pondweed (*Potamogeton richardsonii*, 5%). Native species results are generally comparable to those reported in prior surveys with a few exceptions. A common native species, *Ceratophyllum demersum*, remains dominant in Lake Iroquois but at lower frequency of occurrence. Pondweed species (*Potamogeton amplifolius*, *P. foliosus* and *P. zosteriformis*) were generally more abundant in September post-treatment surveys, particularly Broad-leaf Pondweed. Declines in most native species are observed as a result of invasion and canopy formation by Eurasian watermilfoil, with recovery generally fairly rapid after removal of the canopy. Shifts in plant growth from year to year are common, particularly with new invaders like Eurasian watermilfoil. These shifts are often attributed to changing weather patterns, plant disease outbreaks or differences in the abundance of plant predators.

Eurasian watermilfoil growth in Lake Iroquois was present primarily as scattered and moderate density growth in September of 2017, while native plant populations were robust and similar to other regional lakes. By the Fall 2019, moderate to dense growth of Eurasian watermilfoil was more typical and native plant populations had declined. In May of 2021 (Figure 5) immediately prior to application of ProcellaCOR EC, Eurasian watermilfoil frequency of occurrence was similar to Fall 2017 and was most abundant at the north end of the lake, the area chosen for treatment with the herbicide. Eurasian watermilfoil was absent in post-treatment surveys in September of 2021 and June of 2022, most likely attributable to the use of the herbicide. In September of 2022, Eurasian watermilfoil was present in 1% of survey points.

**Figure 5. Distribution of Eurasian watermilfoil in Lake Iroquois.**



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# **Appendix A**

## **Lake Iroquois Aquatic Plant Distribution Maps**

